Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (currently amended) An X-ray source comprising:

- an electron source for emission of electrons in an electron beam,
- a target for emission of characteristic, substantially monochromatic X-rays in response to incidence of the electrons of the electron beam onto said target, said target comprising a metal foil of a thickness of between one and three μm and a base arrangement for carrying said metal foil, wherein the metal foil thickness of between one and three μm is smaller than or equal to an electron diffusion depth and for which less than twenty percent (<20%) of electron energy is deposited in the metal foil, wherein the metal of said metal foil has a high atomic number allowing the generation of high intensity bremsstrahlung X-rays in a direction of transmission of the electron beam and generation of low intensity bremsstrahlung X-rays in a direction of reflection from said target and the material substantially included in the base arrangement has a low atomic number not allowing the generation of X-rays, and
- an outcoupling means, which generally only transmits X-rays propagating in the reflection direction of the metal foil over an angular range of ± 20° antiparallel to the incident direction of the electron beam, for outcoupling a background of the low-intensity bremsstrahlung X-rays on which quasi-monochromatic characteristic lines of the metal foil are superimposed resulting in a quasi-monochromatic spectrum of X-rays on the side of the metal foil on which the electrons are incident and which is opposite to the side of the base arrangement~~,~~

~~wherein said base arrangement comprises a rotatable base plate of a material having an atomic number of less than 10~~.

2. (canceled)

3. (currently amended) The X-ray source as claimed in claim 1, wherein said base arrangement comprises a cooling circuit arranged to allow a coolant to flow along the side of said metal foil opposite to the side on which the electrons are incident, further wherein as a result of the metal foil thickness being smaller than or equal to the electron diffusion depth, more than eighty percent (>80%) of the electron energy is deposited directly into the coolant without exceeding the boiling point of the coolant.

4. (previously presented) The X-ray source as claimed in claim 3, wherein the coolant has a mean atomic number of less than 10.

5. (previously presented) The X-ray source as claimed in claim 3, wherein the coolant is water.

6. (previously presented) The X-ray source as claimed in claim 3, wherein said cooling circuit comprises a constriction in the area of the metal foil.

7. (previously presented) The X-ray source as claimed in claim 3, wherein said target further comprises a carrier of low atomic number material supporting the metal foil on the side facing the coolant.

8. (canceled)

9. (previously presented) The X-ray source as claimed in claim 1, wherein the metal of said metal foil has an atomic number between 40 and 80.

10. (previously presented) The X-ray source as claimed in claim 1, wherein said outcoupling means is adapted to outcouple X-rays at angles of an angular range from substantially 70° to 110°, to the surface of the metal foil.

11. (canceled)

12. (previously presented) The X-ray source as claimed in claim 1, wherein said electrons are directed onto the surface of said metal foil at a substantially 90° angle.

13. (previously presented) The X-ray source as claimed in claim 1, wherein said electron source is located outside the X-ray beam to be outcoupled, said X-ray source further comprising means for directing the electron beam onto the metal foil.

14. (currently amended) A target for use in an X-ray source for the generation of characteristic, substantially monochromatic X-rays in response to the incidence of electrons in an electron beam, said target comprising a metal foil of a thickness of between one and three μm and a base arrangement for carrying said metal foil, wherein the metal foil thickness of between one and three μm is smaller than or equal to an electron diffusion depth and for which less than twenty percent (<20%) of electron energy is deposited in the metal foil, wherein the metal of said metal foil has a high atomic number allowing the generation of high intensity bremsstrahlung X-rays in a direction of transmission of the electron beam and generation of low intensity bremsstrahlung X-rays in a direction of reflection from said target and the material substantially included in the base arrangement has a low atomic number not allowing the generation of X-rays, and

wherein said base arrangement comprises a rotatable base plate of a material having an atomic number of less than 10, further wherein a background of the low-intensity bremsstrahlung X-rays on which quasi-monochromatic characteristic lines of

the metal foil are superimposed results in a quasi-monochromatic spectrum of X-rays produced on the side of the metal foil on which the electrons are incident and which is opposite to the side of the base arrangement.

15. (currently amended) An X-ray source comprising:

- an electron source for emission of electrons in an electron beam, and
- a target for emission of substantially monochromatic X-rays in response to incidence of the electrons of the electron beam onto said target, said target comprising a metal foil of a base arrangement, said metal foil of a thickness of between one and three μm, wherein the metal foil thickness is smaller than or equal to an electron diffusion depth and for which less than twenty percent (<20%) of electron energy is deposited in the metal foil, said metal foil allowing the generation of high intensity bremsstrahlung X-rays in a direction of transmission of the electron beam and generation of low intensity bremsstrahlung X-rays in a direction of reflection from said target and the base arrangement not allowing the generation of X-rays,

wherein said base arrangement comprises a cooling circuit to allow a coolant to flow along the side of said metal foil opposite to the side on which the electrons are incident, further wherein as a result of the metal foil thickness being smaller than or equal to the electron diffusion depth, more than eighty percent (>80%) of the electron energy is deposited directly into the coolant without exceeding the boiling point of the coolant, and

wherein said target further comprises a carrier having a mean atomic number of less than 10 supporting the metal foil on the side facing the coolant, further wherein a background of the low-intensity bremsstrahlung X-rays on which quasi-monochromatic characteristic lines of the metal foil are superimposed results in a quasi-monochromatic spectrum of X-rays produced on the side of the metal foil on which the electrons are incident and which is opposite to the side of the base arrangement.

16. (canceled)

17. (previously presented) The x-ray source as claimed in claim 15, wherein the coolant is water.

18. (previously presented) The x-ray source as claimed in claim 15, wherein said cooling circuit comprises a constriction proximate the metal foil.

19. (canceled)

20. (previously presented) The X-ray source as claimed in claim 1, wherein said outcoupling means is adapted to outcouple X-rays in a direction at an angle in the range from 160° to 180° to the direction of incidence of said electrons.